

**Amendment to the Claims:**

*This listing of claims replaces all prior versions, and listings, of claims in the application.*

Claims 1-12. (Cancelled).

13. (Currently Amended) A magnetic nanotube comprising:

a plurality of bacterial magnetic nanocrystals, each of the plurality of bacterial magnetic nanocrystals comprising an outer layer;  
a nanotube having an interior surface and an exterior surface, the nanotube being able to absorb the bacterial magnetic nanocrystals, wherein the nanotube is a peptide bolaamphiphile nanotube;

wherein the plurality of bacterial magnetic nanocrystals are contacted on at least one of the interior and the exterior surface of the nanotube.

14. (Currently Amended) The magnetic nanotube of Claim 13, wherein the at least one of the interior and the exterior surface is the interior surface, and wherein the plurality of bacterial magnetic nanocrystals are is substantially aligned to form a linear chain on the interior surface of the nanotube.

15. (Currently Amended) The magnetic nanotube of Claim 13, wherein the outer layer comprises proteins, further wherein the nanotube comprises peptides, and wherein the outer layer of the plurality of the bacterial magnetic particles nanocrystals binds with the peptides.

16. (Original) The magnetic nanotube of Claim 13, wherein the plurality of bacterial magnetic nanocrystals are synthesized by bacteria selected from the group comprising *Magnetospirillum magnetotacticum* MS-1, *Magnetospirillum gryphiswaldense*, and *Magnetospirillum magneticum* AMB-1.

17. (Original) The magnetic nanotube of Claim 13, wherein each of the plurality of bacterial magnetic nanocrystals is substantially spherical and has an average diameter substantially in a range of about 50 to about 100 nanometers.

18. (Original) The magnetic nanotube of Claim 13, wherein the bacterial magnetic nanocrystals comprise at least one of magnetite ( $\text{Fe}_3\text{O}_4$ ) and greigite ( $\text{Fe}_3\text{S}_4$ ).

19. (Currently Amended) The magnetic nanotube of Claim 13 ~~adapted for use used~~ as a magnetic nanowire.

20. (Original) The magnetic nanotube of Claim 13, the magnetic nanotube being characterized as ferromagnetic, and exhibiting a magnetic field of at least 4 mT.

21. (Currently Amended) The magnetic nanotube of Claim 13, wherein the magnetic nanotube is ~~adapted for use used~~ in one of a cell separation system, a biological assay system, and an enzyme recovery system.

22. (Currently Amended) The magnetic nanotube of Claim 13, wherein the magnetic nanotube is ~~adapted for use used~~ in cell manipulation.

23. (Original) The magnetic nanotube of Claim 13, further comprising at least one of a biological material chosen from the group comprising a peptide, a second protein, an enzyme, an antibody, a cell, a DNA, a gene, a virus, a bacteria, a pathogen, and a membrane, the at least one of the biological material attaching to at least one of the interior and the exterior surface of the nanotube.

24. (Currently Amended) The magnetic nanotube of Claim 23, wherein the biological material comprises the cell, the cell being a diseased cell, wherein the magnetic nanotube is adapted for use used in cell manipulation, a magnetic probe being used to separate the diseased cell from a plurality of healthy cells.

25. (Currently Amended) The magnetic nanotube of Claim 13, further comprising one of a drug and a gene attached to one of the interior and the exterior surface, wherein the magnetic nanotube is adapted for use used in one of a drug delivery system and a gene delivery system, wherein a magnetic field guides the one of the drug and the gene to a desired location.

26. (Currently Amended) The magnetic nanotube of Claim 13, wherein the magnetic nanotube is adapted for use used in a magnetic resonance imaging system.